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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/227,174 01/07/99 PIAZZA

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EXAMINER

WM02/1010

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ART UNIT

PAPER NUMBER

2613
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10/10/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/227,174

Applicant(s)
Piazza et al

Examiner
Richard Lee

Art Unit
2613



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Jul 16, 2001.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 14 and 19 is/are allowed.
- 6) ☒ Claim(s) 1-13, 15-18, and 20-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☒ The proposed drawing correction filed on Jul 16, 2001 is: a) ☒ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- *See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892) 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 16) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948) 19) ☐ Notice of Informal Patent Application (PTO-152)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 12 20) ☐ Other:

Art Unit: 2613

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "first-in-first-out buffer" as claimed in claim 22 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 2, 4, 6, 7, 9, 11-13, 17, and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Eto et al (5,652,823).

Eto et al discloses a video data encoder and decoder as shown in Figures 1, 2, 7, and 15, and the same method, apparatus, and circuit for generating motion compensated video as claimed in claims 1, 2, 4, 6, 7, 9, 11-13, 17, and 18, comprising the same receiving a motion compensation command (i.e., decoding control circuit 25 of Figure 7, see column 24, lines 5-67) having associated correction data related to a macroblock; storing correction data related to a macroblock in a memory (i.e., 16 of Figure 7 and see Figure 15I, column 4, column 35, lines 13-30) according to a first order corresponding to the motion compensation command; performing frame prediction operations (see Figure 2) in response to the motion compensation command; reading the correction data related to a macroblock from the memory according to a second order (see Figure 15J, column 4, and column 35, lines 13-30); combining the correction data related to a

Art Unit: 2613

macroblock with results from the frame prediction operations to generate an output video frame (i.e., as provided by 413 of Figure 2, see column 4, column 24, lines 5-67); wherein the first order is based on output from an IDCT operation (see Figure 2 and column 24, lines 5-13); wherein the motion compensation data includes at least one motion vector (see column 33, lines 18-34); a command stream controller (i.e., 17 of Figure 7 and see column 24, lines 14-36) coupled to receive an instruction to manipulate motion compensated video data; a write address generator coupled to the command stream controller (see column 35, lines 13-30); a memory (i.e., 16 of Figure 7) coupled to the command stream controller and to the write address generator, the memory to store pixel data related to a macroblock in a first order determined by the write address generator (see Figure 15I, column 4, and column 35, lines 13-30); processing circuitry coupled to the write address generator to receive control information and data from the command stream controller to generate a reconstructed video frame (see Figures 2 and 7); a read address generator (see column 35, lines 13-30) coupled to the processing circuitry and to the memory, the read address generator to cause the memory to output the pixel data related to a macroblock in a second order (see Figure 15J, column 4, and column 35, lines 13-30); and wherein the first order is block by block row major order, and the second order is based on row major order (see column 4).

Art Unit: 2613

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 3, 5, 8, 10, 15, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eto as applied to claims 1, 2, 4, 6, 7, 9, 11-13, 17, and 18 in the above paragraph (3), and further in view of Mizobata et al of record (5,892,518).

Eto discloses substantially the same method, apparatus, and circuit for generating motion compensated video as above, but does not particularly disclose the followings:

(a) wherein performing frame prediction operations comprises generating a bounding box containing the macroblock, iterating the bounding box, fetching reference pixels, filtering the reference pixels, averaging the filtered reference pixels, if necessary, and adding correction data to the reference pixels as claimed in claims 3 and 8;

(b) performing texturing operations for the macroblock as claimed in claims 5 and 10; and

(c) the processing circuitry comprises a setup engine that determines a bounding box for pixels manipulated by the instruction, wherein the bounding box contains all edges of a macroblock and wherein the processing circuitry comprises a windower having a first mode wherein pixels inside a triangle within a bounding box are processed and a second mode wherein all pixels within the bounding box are processed as claimed in claims 15 and 16.

Art Unit: 2613

Regarding (a) to (c), Mizobata et al discloses an image generating apparatus with pixel calculation circuit including texture mapping and motion compensation as shown in Figures 1, 2, 4A, 4B, 9, 10-12, 14A, 14B, 16, 17, 19A, 19B, 21, 22, 40, 41, and 43, and teaches substantially the same frame prediction operations comprising means for generating a bounding box, means for iterating the bounding box, means for fetching reference pixels, means for filtering the reference pixels, means for averaging the filtered reference pixels, if necessary, and means for adding correction data to the reference pixels (see 3009, 3010 of Figure 40, Figures 9-12, and 41-43); means for performing texturing operations for the macroblock (see Figures 10-12, and columns 28-30); and processing circuitry comprising a setup engine that determines a bounding box for pixels manipulated by the instruction, wherein the bounding box contains all edges of a macroblock and wherein the processing circuitry comprises a windower having a first mode wherein pixels inside a triangle within a bounding box are processed and a second mode wherein all pixels within the bounding box are processed (see Figures 9-12, 40-43). Therefore, it would have been obvious to one of ordinary skill in the art, having the Eto and Mizobata et al references in front of him/her and the general knowledge of motion compensation and texture image processings, would have had no difficulty in providing the bounding box of macroblock data including the manipulation of pixels thereby containing all edges of a macroblock as well as texture operations as taught by Mizobata et al for the video imaging system of Eto for the same well known purposes as claimed.

Art Unit: 2613

6. Claims 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eto as applied to claims 1, 2, 4, 6, 7, 9, 11-13, 17, and 18 in the above paragraph (3), and further in view of Herrera (6,208,350).

Eto discloses substantially the same method, apparatus, and circuit for generating motion compensated video as above, further including a processing unit coupled to the read address generator and to the command stream controller, the processing unit to perform motion compensation operations (see Figures 2 and 7); memory to store reference pixels (see 407, 408 of Figure 2); mapping address generator to provide read addresses for the reference pixels (see column 35, lines 13-30); a first in first out buffer (see Figure 8); the read address generator coupled to a write address generator, the write address generator to generate synch points and the read address generator to receive the synch points to prevent the read address generator from overwriting valid data in the memory (see column 24, lines 46-62, column 35, lines 13-30).

Eto does not particularly disclose, though, the processing unit to perform texture mapping operations utilizing common circuitry; a bilinear filter coupled to the memory, the bilinear filter to access the reference pixels from the memory and to filter the reference pixels; the first in first out buffer coupling the mapping address generator to the bilinear filter, the buffer to maintain sequence of the read addresses from the mapping filter address generator to the bilinear filter as claimed in claims 20 and 22. However, Herrera discloses a method and apparatus for processing DVD video as shown in Figures 1 and 7, and teaches the conventional texture mapping operations and bilinear filterings within motion compensation systems (see column 14, lines 45-60).

Art Unit: 2613

Therefore, it would have been obvious to one of ordinary skill in the art, having the Eto and Herrera references in front of him/her and the general knowledge of motion compensation video systems, would have had no difficulty in providing the texture mapping operations and bilinear filterings of Herrera within the motion compensated video system of Eto for further providing substantially the same if not the same texture mapping operations utilizing common circuitry, the bilinear filtering coupled to the memory, the bilinear filter to access the reference pixels from the memory and to filter the reference pixels, and the first in first out buffer coupling the mapping address generator to the bilinear filter purposes as claimed.

7. Claims 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eto and Herrera as applied to claims 1, 2, 4, 6, 7, 9, 11-13, 17, 18, and 20-23 in the above paragraphs (3) and (6), and further in view of Tourtier et al (5,446,495).

The combination of Eto and Herrera discloses substantially the same method, apparatus, and circuit for generating motion compensated video as above, but does not particularly disclose the apparatus is pipelined and receiving multiple motion compensation commands and performing multiple frame prediction operations in response to the multiple motion compensation commands in a pipeline manner. However, the particular motion compensation pipeline processings and multiple frame prediction operations are old and well recognized in the art, as exemplified by Tourtier et al (see Figures 5 and 7). Therefore, it would have been obvious to one of ordinary skill in the art, having the Eto, Herrera, and Tourtier et al references in front of him/her and the general knowledge of pipeline processings within motion compensation video systems, would

Art Unit: 2613

have had no difficulty in providing the multiple frame prediction operations in response to multiple motion compensation commands in a pipeline manner as taught by Tourtier et al as part of the motion compensation video system of Eto for the same well known purposes as claimed.

8. Claims 14 and 19 are allowed.

9. Regarding the applicants' arguments at pages 8-9 of the amendment filed July 16, 2001 concerning in general that Eto does not disclose storing correction data related to a macroblock in a first order and reading data related to a macroblock in a second order, the Examiner respectfully disagrees. Eto at column 4, lines 26-49 teaches that particular processing of data at the macroblock level on the encoder and decoder side, and further memory 16 of Figure 7 for storing correction data related to a macroblock according to a first order corresponding to the motion compensation command (see Figure 15I, column 35, lines 13-30) according to a first order corresponding to the motion compensation command and the correction data is read related to a macroblock from the memory according to a second order (see Figure 15J, column 4, and column 35, lines 13-30). The GOPs provided in Figures 15I and 15J are nevertheless groups of pictures that are related to a macroblock. As such, it is submitted that Eto anticipates the claimed invention.

Regarding the applicants' arguments at pages 9-10 of the amendment filed July 16, 2001 concerning the section 103 rejection of claims 3, 5, 8, 10, 15, and 16, the Examiner wants to point out that such arguments have been addressed in the above.

Art Unit: 2613

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

11. **Any response to this final action should be mailed to:**

Box AF

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Art Unit: 2613


or faxed to:

(703) 872-9314 (for formal communications; please mark "EXPEDITED
PROCEDURE")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive,
Arlington. VA., Sixth Floor (Receptionist).

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard Lee whose telephone number is (703) 308-6612. The Examiner can normally be reached on Monday to Friday from 8:00 a.m. to 5:30 p.m, with alternate Fridays off.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group customer service whose telephone number is (703) 306-0377.


RICHARD LEE
PRIMARY EXAMINER

Richard Lee/rl

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